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Amman

Adapting to New Challenges

Study Trip Report – GLM Master's Degree – April 2023

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Contents

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PREFACE

AMMAN, A STRATEGIC PLACE

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Amman is a city where geopolitics swirls around you while you sip cardamom-flavored coffee in the street. During our study trip to Amman, someone remarked that Amman is a 'strategic place,' being two hours from Jerusalem and three hours from Damascus. Waves of displaced persons have migrated to Jordan and have been incorporated into the country. An island of stability in a turbulent region, the most recent displacement is from Syria. This displacement has strained infrastructure, prompted foreign funding, and created new arenas for community cooperation and conflict. From its fabled Greco-Roman ruins, a vibrant but deteriorating urban core, expanding boundaries, and new transport infrastructure, this city of rolling hills and sand-coloured buildings continues to adapt to new challenges. Jordan experiences high water stress. Water supply and water infrastructure are of existential importance to the country. Water is politics. A bricolaged system of wells, pipelines, tankers and pumps maintains supply though marked by unequal geographies of access and significant leakage (referred to as non-revenue water). The lure of technology prompts investment in high-tech sensors and AI. This future of algorithmic water management will have to contend with the existing patronage-based system of water supply.

During our trip we were honoured and privileged to meet planners and engineers from the Greater Amman Municipality, the Mayor of Zarqa His Excellency Emad al-Momani, experts associated

with AFD (Agence Française de Développement), GIZ (Gesellschaft für Internationale Zusammenarbeit) and the World Bank, the Royal Society for the Conservation of Nature, German Jordanian University, American Center of Research and Miyahuna Water. For their insights and generosity, thanks to Rami Daher, Nabil Abu Deyyah, and Rawan Attour. Our most heartfelt thanks are due to Myriam Ababsa, and Ahmad Zeyad. In the chapters of this report, the reader will find our learnings and impressions from our trip to Amman. The Governing the Large Metropolis (GLM) master's program at the Urban School of Sciences Po, Paris, is grateful to all the urban experts who so kindly shared their time, knowledge, and enthusiasm for Amman with us. A special thanks to Anav Jha and Jules Percher for editorial management.

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1– AN INTRODUCTION TO AMMAN

Celia Zuberec - Shuangjin Li - Lucia Rossignol - Mary-Alice Williams

Amman is the capital city of Jordan, a country of 11,148,278 inhabitants. Despite economic recovery post-COVID, the country's economy is still struggling. GDP grew by 2.2 percent in 2021 and unemployment remains a challenge.[1] The country's population is currently facing a high 17.9 percent unemployment rate, which is way higher than 10.7 percent, the average employment rate of the whole Arab region.[2] Jordan is a constitutional monarchy led by King Abdullah II of Jordan, along with Prime Minister Bisher Al-Khasawneh. And it is amongst the driest nations in the world. The residents face severe water shortages and challenges.

Amman is in North-West Jordan, which is in a semi-arid climate zone, far from the country's borders, where its main water sources are located. In terms of geography, Amman was built on mountainous terrain and seven hills. The hilly character of the city creates unique challenges, such as making it difficult to build underground transportation and water supply infrastructure. Amman's population is 4.64 million, which represents 42 percent of the total country's population.[3] It is an extremely diverse city hosting about 1.6 million refugees and displaced persons from mainly Syria, Palestine and Iraq. Some reside in separate refugee camps dispersed throughout the Greater Amman region. Unsurprisingly, most do not wish to live permanently in the camps but set in cities or nearby rural areas, where it is easier for them to access jobs.[4] The rest of this chapter focuses on the spatiality of Amman divided along an East-West axis.

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[1] *World Bank, 2021 https://data.worldbank.org/country/JO*

[2] *World Bank, 2022 https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=1A*

[3] *Jordan News, 2022 https://www.jordannews.jo/Section-109/News/Amman-makes-up-42-of-the-Kingdom-s-population-21761*

[4] *https://www.afd.fr/en/carte-des-projets/urban-inequalities-within-jordan-cities-hosting-refugees-amman-irbid*

Building Typologies Across Neighbourhoods

In Amman, the building typology varies across neighbourhoods due to factors such as income, access to facilities, and the quality and maintenance of infrastructure. Each residential zone can be categorised into one of seven categories: A, B, C, D, Agricultural Residential, Rural Residential, and Residential with Special Regulation (Amman Spatial Profile). Type D is considered the most affordable of the residential typologies. Examination of land use maps shows that the residential typology divide between East and West Amman is significant, with East Amman representing a large proportion of residential type D.

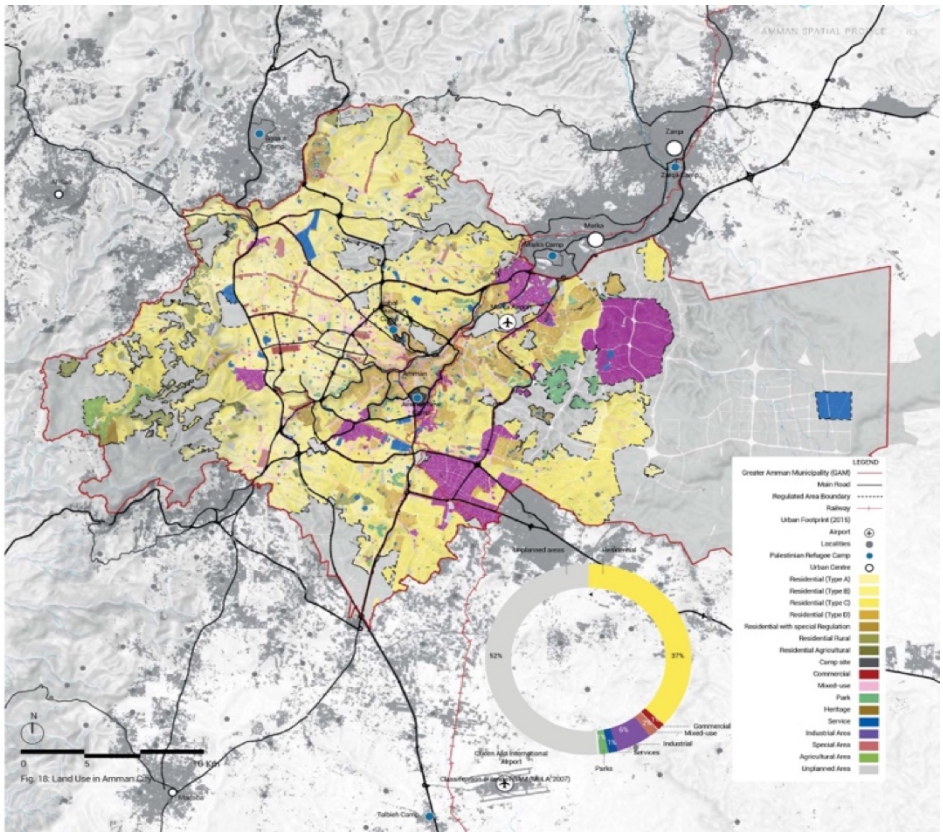

Fig. 1: Land Use in Amman City (UN-Habitat, 2013)

In addition to the affordability measures of residential areas, the building types further represent the spatial disparity of different city areas. Density is high in the central area of the city, on both the East and Western sides, indicating a higher prevalence (over half

of Amman's housing) of multi-family or apartment-style housing.[5] The more rural areas on the boundaries of the Greater Amman area show significant percentages of traditional houses, or dar, which typically have one to two stories and may include a courtyard.[6]

A significant population of refugees and displaced persons in Amman tends to reside in camps that are not included in land use plans, while the land occupied by the camps is usually classified as residential.[7] Since the 20th century, informal and self-built housing settlements have developed near and around the formal refugee camp centres. Due to the historical trajectory of refugee camps in Amman, many of the original buildings have been informally added to by residents, but the municipality identifies the self-built portions of those add-ons as dars.[8]

This potential mismatch in recorded versus actual building typology may affect an accurate assessment of the spatial distribution of Amman residential building typologies.

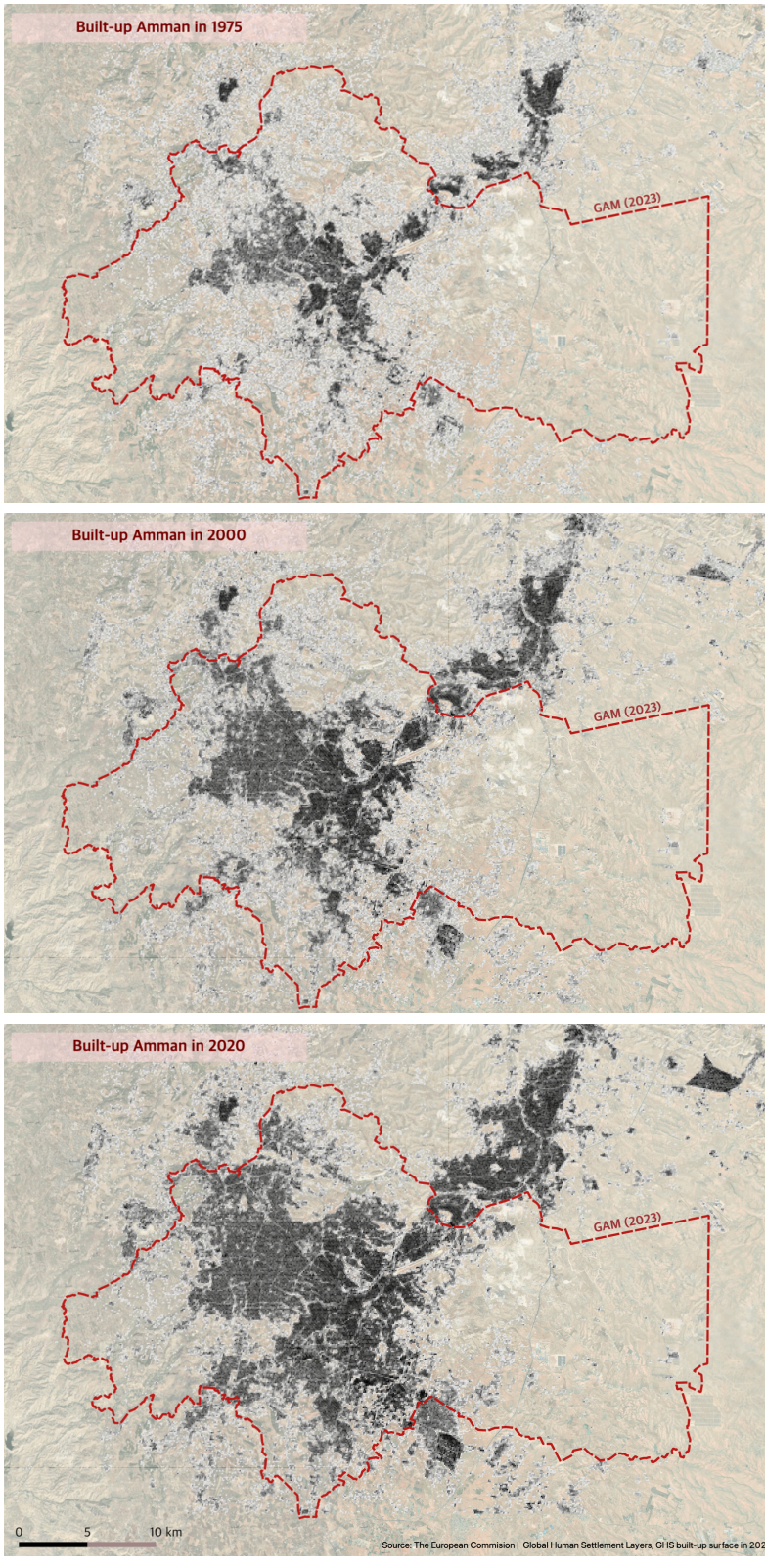

Fig. 1bis: Built up Amman from 1975 to 2020. Source: Mapped (Jules Percher) from Global Human Settlement Layers. Built-up surface.

[5] *Ababsa, IFPO, 2010*
[6] *Ababsa, 2013*
[7] *UN-Habitat, 2013*
[8] *Ababsa, 2013*

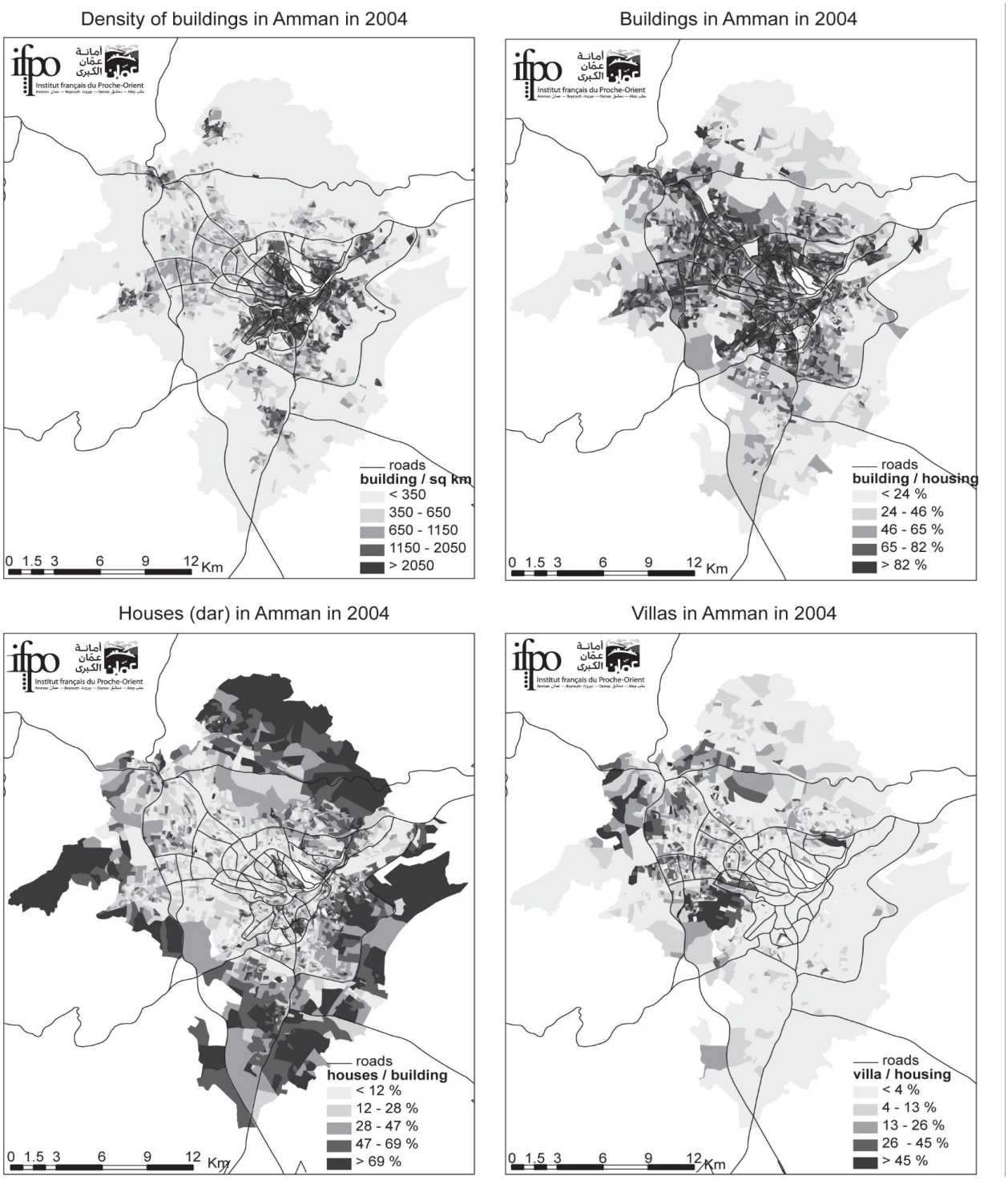

Fig. 2: Types of housing units and density of buildings in Amman in 2004
(Ababsa, IFPO, 2010)

Socio-spatial Disparities

Social disparities between East and West Amman are becoming increasingly pronounced, reflecting the differences in housing, activities, citizenship status, lifestyles, and perceptions of others. Block-level maps produced by Ababsa provide a visual representation of the division between the Eastern and Western neighbourhoods in Amman. West Amman stretches from Jabal Amman to Khalda, bounded by Wadi Hadizadeh to the North and Wadi Deir Ghbar to the South.[9] On the other hand, East Amman encompasses the historical centre of Amman and accounts for over half of the city, including its northern and southern expansions (as shown in Fig. 2).

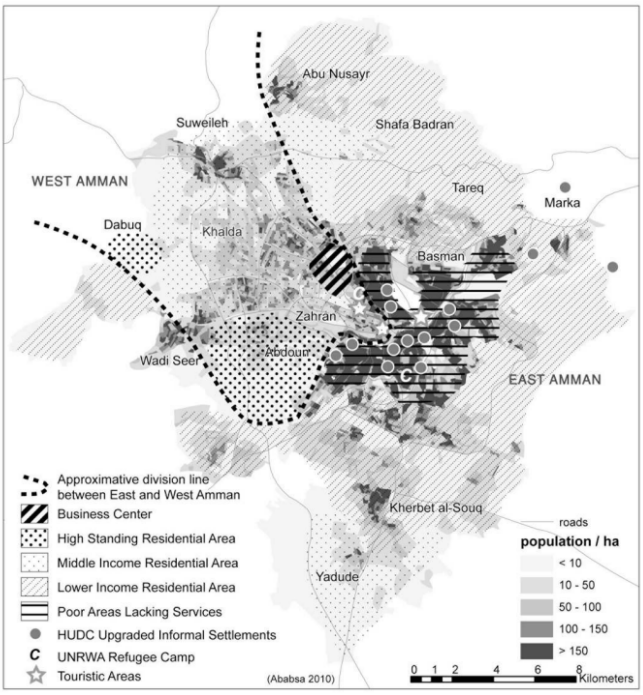

Fig. 3: Amman Urban Morphology and Approximative Division Line Between East and West Amman (Ababsa, 2013)

To be more specific, informal settlements near UNRWA (United Nations Relief and Works Agency for Palestine Refugees) camps are densely populated and also accommodate low-income foreigners, primarily Palestinians from Gaza with Egyptian travel documents, and Iraqi refugees.[10] These areas have become pockets of poverty, lacking adequate health and education services. According to surveys carried out by the Housing & Urban Development Corporation (HUDC) in 2000, a significant percentage of families in East Amman were living in poverty, earning less than 100 Jordanian Dinars (JOD) per month, which is the amount provided by the Ministry of Social Affairs for basic needs. Only a quarter of families reported monthly earnings of more than JOD 200. In the western

[9] *Ababsa, 2011*

[10] *Ababsa, 2013*

neighbourhoods, there is a higher proportion of an active labour force, better education levels and more developed buildings and infrastructure.[11]

Since the early 1980s, the Amman municipality has attempted to address the inequalities between the East and the West, including implementing upgradation policies and launching the downtown revitalisation programme. However, social disparities within the city continue to get stronger.[12] Property developments are largely private and neglect underprivileged areas, which suffer from a lack of affordable housing and employment opportunities (see Chapter 5 on Housing in this report). The Community Development Fund, funded by taxes on additional floors of tower blocks, lacks coordination between the GAM (Greater Amman Municipality) and the HUDC, thus remaining underutilised.[13] Furthermore, social housing built by the HUDC under the Royal Initiative for Housing scheme is situated far from urban areas in the desert, contesting the residents' "rights to the city."[14]

West Amman: Globalisation, consumption, and economic development

Over the last two decades, King Abdullah's leadership has implemented economic and legal reforms that have greatly shaped the urban and social geography of West Amman, creating a strong juxtaposition with the East.[15] Such reforms have included market liberalisation, the creation and expansion of free trade zones, and processes of privatisation.[16] In parallel, various changes to the legal system have been implemented in order to facilitate foreign direct investment and free trade.[17] The impacts of such policies have been most visible in West Amman, which has rapidly become a cosmopolitan area replete with Western-style bars and restaurants, elite health clubs, high-end nightclubs, malls, designer fashion boutiques and international hotel chains.[18]

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[11] *Ibid.*

[12] *Ibid.*

[13] *Ibid.*

[14] *Ibid.*

[15] *Schwedler, 2010*

[16] *Ibid.*

[17] *Ibid.*

[18] *Ibid.*

The diversification of West Amman's spaces of consumption and leisure has also been accompanied by major urban interventions, including the construction of skyscrapers, the upgrading of telecommunication systems, and the repaving of roads and sidewalks.[19] In contrast, East Amman, home to many of the city's working-class residents, remains largely unchanged as compared to twenty years ago, save for its expansion into surrounding neighbourhoods and the moderate upgrading of public spaces.[20] Given the low income of many of the households of East Amman, the western neighbourhoods and their sites of consumerism have therefore come to symbolise an exclusive environment, out of reach for many of the city's residents.[21]

Rainbow Street is one such area in Amman that has been targeted for urban, economic, and cultural regeneration and is frequented by wealthy West Ammanis.[22] Here, interlocking processes of urban regeneration, cultural diversification, and economic development have largely transformed the neighbourhood.[23] Upon visiting it during our time in Amman, the forces of globalisation and market liberalisation were readily apparent, with bars serving favourite international drinks and cuisine, and many bars playing American and European music.[24] Notably, while a typical meal in East Amman can be priced below JOD 3.50 (about EUR 5), prices in bars and restaurants in Rainbow Street and West Amman are more generally on par with those found in Paris or other Western cities. Overall, there are notable spatial divisions in Amman's urban landscape that largely run along the lines of East versus West, symbolising two very different ways of life that currently co-exist in Amman.

[19] *Ibid.*

[20] *Ibid.*

[21] *Ibid.*

[22] *Daher, 2013*

[23] *Ibid.*

[24] *Schwedler, 2010*

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2– GEOPOLITICS OF JORDAN: THE CAPITAL OF PEACE IN A TURBULENT REGION

Nicolas Pitanga - Nihad Lablack - Noah Weichgrebe - Xiaochen Wang

Jordanian Place in the Unstable Context of the MENA Region

Jordan is located in the heart of the Middle East with a chaotic political situation in the surrounding area. As a country to the East of Israel, the South of Syria and the South-West of Iraq (as shown in Fig. 1), Jordan has not only been tied closely to the Palestinian conflict historically but has also been threatened by the terrorism and the political turbulence in the Arab world in recent decades. Therefore, the major goal of the foreign policy of Jordan is to maintain peace and security while balancing the regional powers in the sophisticated geopolitical environment.[25] It also insists on Arabic and Islamic attributes while maintaining friendly relationships with Western countries, and is open to tourists and foreign aid for economic development.[26]

Fig. 1: The Map of Jordan
Source: www.worldatlas.com/maps

[25] *Tang, 2016*

[26] *Ibid.*

Jordan in the Arab Spring

Although Jordan faced similar socio-economic conditions as Tunisia and Egypt in the 2010s with domestic protests against high unemployment, rising food prices and corruption, the government was relatively stable without the experience of massive demonstration for regime change.[27] This internal political harmony might contribute to the dynamic relationship of the ruling group to its diverse oppositions. Firstly, the ethnic division in Jordan did not lead to political upheavals because both the Transjordanians from the East and the Jordanians of Palestinian origin benefited from the regime either through political privilege or economic accomplishment.[28] As each group feared being in a lose-lose situation, they preferred not to pursue fundamental political change. Secondly, the ideological division in Jordan is not sharp and irreconcilable. Although the Jordanian Muslim Brotherhood called for political reform due to its marginalisation in the elections in recent decades, the Islamic Action Front (IAF) is still well integrated into the Jordanian political landscape and has refrained from calling for revolutionary change.[29] Moreover, the protestors, such as the IAF and liberal youth groups, only shared the macro-demands without reaching an agreement on the means for achieving their goals, which did not form an overwhelming force against the government. Besides, as citizens had observed the bloody events in Tunisia and Syria and feared violence, the protest in Jordan was neither violent nor did it challenge the basis of its political system.[30]

On the other hand, the protest in Jordan has been treated positively with national political reform and international aid.[31] In response to the protests, the Jordanian government proposed constitutional amendments and reformed laws relating to elections and the formation of political parties.[32] In addition, foreign policies were tailored to attract greater economic aid to Jordan to offset the budget deficit and improve the living conditions of the people.[33] Meanwhile, due to its sensitive

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[27] *Beck and Huser, 2015; Comolet, 2014*

[28] *Beck and Huser, 2015*

[29] *Helfont and Helfont, 2012*

[30] *Ibid.; Beck and Huser, 2015*

[31] *Beck and Huser, 2015*

[32] *Ibid.*

[33] *Barari and Satkowski, 2012*

geographical position and its function as a geopolitical service provider, international powers, international organisations, as well as the regional monarchies in the Persian Gulf, found mutual interests with the monarch.[34] Therefore, these international actors have provided political and economic support to Jordan to maintain its social stability and its capacity to receive forced migrations from neighbouring countries.[35] This support is not only through direct financial aid but also includes technical assistance, loans, security and military support, as well as investments in development projects, et cetera.[36]

Monarchy, Hashemite Regime and Legal System

The Hashemite Kingdom of Jordan is a constitutional monarchy ruled by King Abdullah II bin Hussein. The royal family has ruled the country since 1921. The Hashemites are considered to be direct descendants of the great-grandfather of Prophet Muhammad, which is a central reference point in the construction of the Jordanian identity. Historically rulers of Mecca, the royal dynasty was opposed to the Ottoman Empire during the Arab Revolt of 1916. In addition to the strong roots of the royal descendants, the monarchical form of the government brings relative stability, especially during critical episodes such as the Arab Spring. Until 1918, Jordan was part of the Ottoman Empire, and its legal system was based on Sharia law. After Jordanian independence in 1946, the structure of the legal code and jurisprudence changed. The religious court is now only involved in matters of personal law.[37]

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[34] *Beck and Huser, 2015*

[35] *Ibid.*

[36] *Ibid.*

[37] *Bianca C. Isaias and Fred Jennings (2013). Overview of the Hashemite Kingdom of Jordan Legal System and Research. https://www.nyulawglobal.org/globalex/Jordan.html.*

Governance and Finance at the National Level

◊ *Waves of Migration*

Since the mid-20th century, the region has experienced successive episodes of political instability and violence that, in turn, have led to humanitarian disasters. One of the most consequential of these episodes was the creation of Israel and the following nakba, in which about 800,000 Palestinians were displaced and deported from the newly created Jewish state.[38] Given Jordan's proximity to Palestine and its role in the subsequent negotiations to resolve the diplomatic and humanitarian impasse, most fleeing Palestinians ended up in the neighbouring kingdom, especially in its capital, Amman.

Throughout the rest of the twentieth and twenty-first centuries, other waves of refugees and displaced persons would flee to Jordan for stability. These groups contributed to a significant population expansion. They are, thus, an intrinsic part of the formation of modern Jordan and, especially Amman, that, over time, incorporated several refugees and displaced person camps into its urban tissue, consolidating into important and lively neighbourhoods of the city.

◊ *Subsidised Goods*

Subsidies on goods and food have long been part of Jordanian public policy. Subsidised products such as milk, water, cooking oil and especially bread are of paramount importance for some middle and lower classes that base their diet on them. Therefore, government subsidies are not only part of Jordan's 'moral economy,'[39] but also protect its social and political stability. Bread riots have occurred in Jordan every time the government has attempted to scale back subsidies due to pressure from the International Monetary Fund (IMF).[40]

◊ *International Funding and Investment*

The increased presence of international investment in Jordan is often related to neoliberal and municipal reforms pursued since the 1990s. There have been many

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[38] *https://www.theguardian.com/news/2021/may/18/a-jewish-case-for-palestinian-refugee-return.*

[39] *Martínez, 2018*

[40] *Leathers, 2015*

decentralisation plans, aiming to deconcentrate power, despite not being successfully implemented.[41] Despite this, Jordan implemented several neoliberal policies, including creating Local Development Units (LDUs) in municipalities initiated by the Ministry of Municipal Affairs (MOMA). These units aimed to evaluate and pursue long-term economic opportunities through development projects. These steps towards decentralisation attracted international donors to engage in municipal capacity-building programmes, as these were seen as bearing the potential to increase economic opportunities and enhance political participation.[42]

International donors have emphasised the role of local governments and introduced public-private partnerships.[43] These donors, among which we can find the European Union (EU) and the United States Agency for International Development (USAID), cooperate closely with municipalities to strengthen local governance and alleviate poverty. As such, the role of the LDUs has been heightened following international interest in development projects. Prior to that, many municipalities did not harvest the full potential of the LDUs, being reluctant to create them or unwilling to grant them the required authority to be effective.

Some of these projects have been profitable for investors and municipalities, but many were discontinued or lacked investors. One can identify a few pertinent issues with the development projects. Many local investors were reluctant to invest due to fears of mismanagement of funds. Additionally, with the influential clientelism in the political system of Jordan, it is the municipal council that decides upon the location and specific rules regarding the project, rather than the investors and local citizens. As a result, projects are often concentrated in proximity to the council members' homes or the houses of their close supporters. Also, the use of some facilities is limited to certain groups of people. The positive outcomes associated with the projects are thus limited to a certain group of people, often specific tribes. Lastly, public participation in these projects was often, contrary to the aim, very limited. Hence, the reforms and outcomes

[41] *Al Nimri, 2009*

[42] *Clark, 2012*

[43] *Ibid.*

of the development project remain highly dependent on well-established and local political dynamics.[44]

Governance at the Local Level

Large sections of the inhabitants of the Arab world, with Jordan being no exception, form part of tribes. While the terminology might carry a negative connotation in English, it is merely used in descriptive terms in the region to refer to the lived reality of inhabitants.[45] Tapper understands a tribe as a 'localised group in which kinship is the dominant idiom of organisation, and whose members consider themselves culturally distinct.'[46] In Jordan, a tribe can be seen as a melange of characteristics and claims. Amongst other aspects, tribes have names, know their history in relation to other tribes and follow a segmental structure. They possess juridical customs for dispute resolution that differ from either state law or Islamic law. Jordanian tribe members also emphasise the importance of their tribe's reputation and origins.[47] They should not be confused with nomads, as tribes exist even in urban settings in the region, including the large metropolises. Moreover, tribalism has proved to be adaptive to modern circumstances. Tribes have concentrated social power for several centuries due to a lack of state control or as an alternative relevant unit to states. Unsurprisingly, tribal politics played a crucial role in state formation in the region, with shaykhs (tribal chiefs) often liaising between their communities and the state.[48] While it might be premature to call the tribal system the backbone of the modern Hashemite Kingdom, clearly, tribal structures are involved in various state institutions, with community interests playing a major role. This has led to many attempts by the Hashemite regime to reconfigure the tribal system starting in the 1920s.[49]

The tribal system also plays a crucial role in municipal politics as it points to clientelist politics. The overstaffing of municipal governance bodies has emerged as a part of this

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[44] *Ibid.*

[45] *Alon, 2021*

[46] *Tapper, 1983*

[47] *Shyrock, 2021*

[48] *Alon, 2021*

[49] *Shyrock, 2021*

political calculus. Historically, the regime has cooperated with key tribes, exchanging patronage for loyalty. That led to the perpetuation of a tribal elite, with members of core tribes receiving influential positions in politics, the army, and the civil service.[50] As such, voting is organised around patronage relations instead of policies; the stronger the tie to a candidate, the more likely one is to vote.[51] Since the reconstitution of parliamentary elections, attempts have also been made to ensure the dominance of loyal tribes in power.[52] Indeed, studies suggest that the influence of tribal relations on elections has increased since the 'one person, one vote' system.[53] Consequently, elections strengthen the regime by instilling a competition between elites over limited resources that they can then redistribute to their clients.[54] Voting is thus subject to the impression of who can best provide access to services and resources.[55] As municipal power and resources decrease, competition is becoming tougher. In response, tribes often hold internal unofficial pre-elections to find a consensus and ensure a positive electoral outcome. Even unaligned Palestinians often coordinate their votes, allying with tribal candidates in exchange for the promise to provide services or access to influential positions.[56]

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[50] *Clark, 2012*
[51] *Lust, 2009*
[52] *Lust et al., 2011*
[53] *Hamarneh, 2000*
[54] *Lust, 2009*
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3– THE TWO FACES OF "HERITAGE" IN AMMAN BUILT ENVIRONMENT

Alexandre Moity - Nicholas Moore - Jeremy Epstein

The question of heritage in Amman is illustrated in the stark difference between the shimmering glass towers of the new central business district (Al-Abdali) and the bustle of the historic downtown (Wa-sat Al-Balad). Located in the valley between the city's seven hills, the downtown is one of the oldest continuously inhabited places in the world. The Citadel and Roman Theatre antiquity sites are both located here as a reminder of the ancient past, but Al-Balad is also the liveliest part of the city today. Despite zoning restrictions, fears of seismic activity, auto congestion, and haphazard pedestrian infrastructure, Amman's downtown is the commercial and social hub of the city. In contrast, the Al-Abdali project on the far west side of the city is a public-private partnership that launched in 2004. The project features two Emirati-sponsored hotels, now the two tallest buildings in Jordan, a brand-new hospital, and mixed-use buildings along a grand commercial boulevard. The project has been a catalyst for foreign investment, tourism, and shopping, with over 20 million visitors in 2022.[57]

Fig. 1: Roman Columns by the Amphitheatre.
Photo Credits: Enikö Zoller

[57] *Jordan Times, 2023 https://jordantimes.com/news/local/abdali-stands-tall-investment-leisure-destination-%E2%80%98-heart-amman%E2%80%99.*

Areas like Al-Abdali are a reminder of the tremendous growth Amman has experienced over the past decades, of its evolution into yet another site in which global capital accumulates. However, it is also a testament to the distance, both figuratively and

Fig 2: The Hashemite Plaza in central Amman. Photo Credits: Alexandre Moity

literally, between Amman's historic, archaic, and bustling centre, surrounded by ancient Greek, Roman, Ottoman and Byzantine heritage, and its newer, clean business districts, characterised by glass towers and shopping malls indistinguishable from those of other wealthy global cities.

This begs the question: what does Amman mean today? The city is at a crossroads, balancing the expansion of globalised spaces like Al-Abdali and the preservation of the unique built environment of its historic centre. Al-Balad plays an important role in the lives of East Amman's poorer residents as a place of socialisation, as opposed to the consumption-driven experience of Al-Abdali, which in any case is placed closer to the city's middle and upper-class neighbourhoods, far from the East Side. The modern skyscrapers and malls of Al-Abdali are not unique to Jordan and have their own economic momentum, but the distinctive architecture and feel of Al-Balad should be preserved. The spread of restaurants and shops catering to tourists along Rainbow Street

and other areas of Jabal Amman, along with the consolidation of small historic shops downtown into large new buildings, have made Amman's historic character all the more vulnerable, and the task of preserving it ever so arduous. One possible intervention could utilise the framework of heritage preservation, which, though traditionally reserved for antiquity sites, can also recognise the cultural value of Al-Balad. For instance, the historic downtown features the oldest mosque (Al-Hussein) and the oldest market in Jordan. The low-rise density and pedestrian step-paths leading to the neighbouring hills present a uniquely Ammani sense of place. Infrastructure investments, like the new BRT project, and the safeguarding of sites through heritage preservation or adaptive reuse programs can ensure Al-Balad maintains its distinctive cultural heritage while continuing to serve Ammanis' daily needs.

Amman's Place in Jordanian Identity

The tensions Amman spans are not limited to the different markers of development across neighbourhoods. As an ancient city serving as the capital of a relatively young state, Amman also encompasses larger tensions about what it means to be Jordanian. Like the few extant pillars standing at the Citadel, carefully hoisted and arranged to evoke the grandeur of a building long-departed, so too do efforts to craft the city's heritage rely on the selective presentation of a few elements as a means of conjuring a larger history. Jordan has long been among the countries hosting the most refugees per capita anywhere. Around 20 percent of Jordan's population are Palestinian refugees or displaced persons (the word 'refugees' is not always welcome in Jordan, especially for the Palestinians who arrived in 1948 and have the status of full citizens), and many more are the children, grandchildren and great-grandchildren of people who lived in Palestine prior to or after the foundation of the state of Israel (by some estimates 70 percent of the Jordanian population is of Palestinian origin (Savir, 2013)). This connection between Jordan and Palestine can be observed in the cultural landscape as well, for example, in the numerous Amman restaurants bearing Jerusalem in their name. (In contrast, one of the city's most well-regarded restaurants among tourists and expatriates is Sufra, the etymology of which references food prepared specifically for travellers). In the 21st century, the country has played host to successive waves of refugees from Iraq and Syria. Overall, Jordan's population has grown from approximately 400,000 in 1948 to more than 11.1 million inhabitants today. This nearly 30-fold increase puts the country in a

class of its own when it comes to population growth. Nation-states are constructed entities, "imagined communities," that attempt to represent the shared histories and identities of a people.[58] For a country overwhelmingly constituted by people who have, until recently, lived somewhere else, these narratives take on a certain urgency. The centrality of refugees in Jordan's history has led to a story which celebrates the country's openness and generosity in welcoming those with nowhere else to go.

There is truth to this narrative: Jordan has been the only Arab state to consistently offer Palestinian refugees' citizenship. However, there is also a realpolitik aspect to Jordan's relationship with its refugees. In recent years, the total foreign aid received has amounted to nearly a third of the government's annual operating budget. And although Palestinian refugees have mostly acquired citizenship, the experience of displaced Iraqis and Syrians has not always entailed smooth sailing. Many of the Jordanians we spoke with in Amman (and Zarqa) emphasised the country's generosity in accepting refugees despite the tremendous strain on its resources - financial, but also natural, notably water - but the question of the refugees' actual standard of living once arrived in Jordan, from the challenge of obtaining healthcare and work permits, much less actual employment, is far from clear.

Refugees overwhelmingly inhabit East Amman, which has not been afforded a role in defining the heritage of the city, much of its urban landscape dominated by informal, unplanned housing. East Amman does not figure in the city's approach to projecting itself to tourists and the international community,

Fig.3: The hills of East Amman, visible behind the ancient Roman theatre. Photo Credits: Alexandre Moity

[58] *Anderson, 1983*

although curious visitors can book an English-language tour of the area's street art. The dominant narrative of Amman's history, promoted by both municipal and national authorities, emphasises its classical history, from the neolithic Ain Ghazal statues displayed in the country's national museum to the classical ruins found downtown, notably the Roman Theatre and Jabal Al-Qalaa (the Citadel).

Many of the ancient buildings of Amman have long been in ruins or disappeared altogether, as inhabitants collected building materials from these sites to use in building their own homes and businesses. The emphasis on this much older past is not confined to Amman, either; for many visitors to Jordan, the image inextricably linked with the country is of Petra, the nearly 3000-year-old Nabatean City carved in stone south of the Dead Sea. So prominent is Petra in the understanding of what Jordan is, and so proud of it are Jordanians, that the Ammanis we spoke with were consistently surprised and puzzled that we would come all the way to visit their country without making the trip into the desert. For them, Amman and Petra represent two stages in a continuous history, that of a country with ancient roots and a modern metropolis.

This ideal of Amman's continuous history, from Petra to Al-Abdali, is observable near the city hall, where a scale model of Amman spreads out over a room bathed in natural light

Fig. 4: The model of Amman, showcasing mainly on the Western portion of the city
Photo Credits: Alexandre Moity

off Ali Ben Abi Taleb Street. The rolling hills of miniature white buildings almost shine, belying the countless variations in brown one experiences while traversing the city. Amman is enormous, sprawling out over some 1,600-odd square kilometres, but even at this tiny scale, the model cannot cover it all. In fact, the model covers much more of the western parts of the city than the east, with the historic core placed off to the side. The viewer is invited to trace the axis formed by the city's "Eight Circles," a series of rotaries extending from the central neighbourhood of Jabal Amman out past the towers of Al-Abdali and beyond, all the way to the westernmost reaches of the city. It is the road back to Jerusalem.

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4– TRANSPORT IN AMMAN: A GRADUAL LANE CHANGE

Anav Jha

Commuter Flows in the City: Supply and Amman'd

Jordan is a highly centralised country, with over 80 percent of its economic activity taking place in the Amman metropolitan region.[59] This, along with inadequate connectivity to other parts of the country, has led to extremely high and competitive demand for housing in the city.[60] A key consequence of this continuous population influx is a sprawl-like urban expansion. Amman has grown well beyond the seven hills (jabals) it once encompassed,[61] to regions along major transport corridors "away from the core of Amman,"[62] which were previously vacant and considered "vegetation areas."[63] Its present-day area of over 240 sq. kilometres is close to twice that of three decades ago.[64] The residential density map (Fig. 1) from the Greater Amman Municipality's (GAM) 2010

Fig. 0 : Trafic in Amman. Photo Credits : Enikő Zoller

[59] *GAM Official: Public Transport & Transport Projects*

[60] *Ibid.*

[61] *Potter, Robert B., et al. "'Ever-Growing Amman', Jordan: Urban Expansion, Social Polarisation and Contemporary Urban Planning Issues." Habitat International, vol. 33, no. 1, 2009, pp. 81–92, https://doi.org/10.1016/j.habitatint.2008.05.005.*

[62] *Al-Bilbisi, Hussam. "Spatial Monitoring of Urban Expansion Using Satellite Remote Sensing Images: A Case Study of Amman City, Jordan." Sustainability (Basel, Switzerland), vol. 11, no. 8, 2019, p. 2260–, https://doi.org/10.3390/su11082260.*

[63] *Ibid.*

[64] *Ibid.*

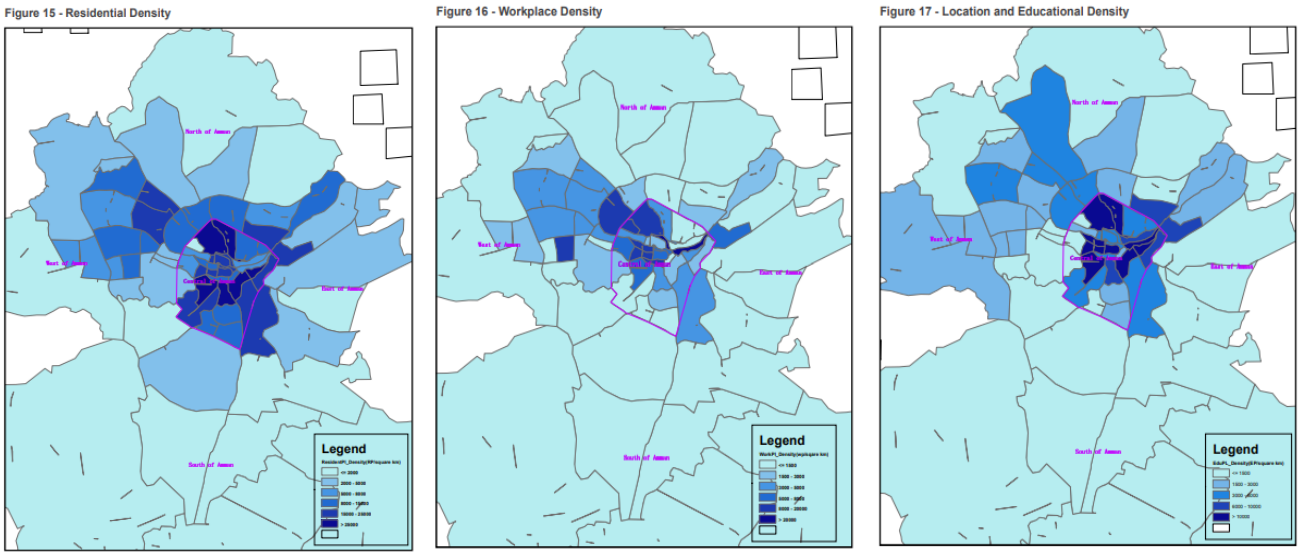

Fig. 1-2: Residential, Workplace and Educational Density Map of Amman (GAM, 2010)

Transport and Mobility Plan for Amman: Final Report[65] helps reflect the dispersed settlement structure in the metropolitan region, with a notably high residential density in Southeast Amman.

Interestingly enough, the majority of workplaces and educational institutions have remained closer to Amman's urban core, particularly in West Amman as is visible from Fig. 2.

The GAM report argues that this disconnect between dispersed residential locations and concentrated workplace locations result in the need for "relatively long cross-city trips,"[66] the majority of which run from the urban periphery (residential regions) to the urban core (workplaces), resembling a hierarchical pattern of commuter flows. Fig. 3 illustrates this below.

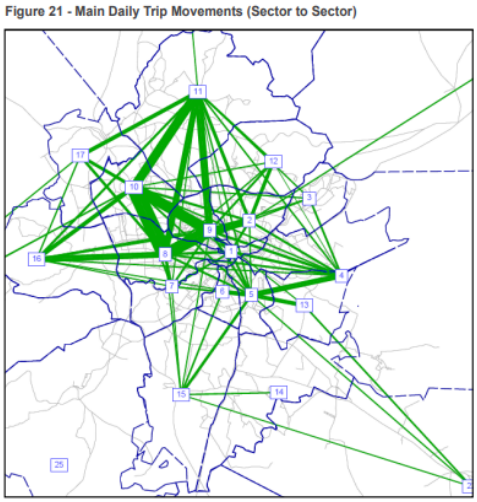

Fig. 3: Commuter Flows in Amman (GAM, 2010, pg. 21)

Abdullah Oqlah Alubstanji et al., when studying Amman's urban mobility hotspots, posit that the metropolitan area's commuter flows remain much the

[65] *"Transport and Mobility Master Plan for Amman: Final Report." Greater Amman Municipality, Apr 2010.*

[66] *Ibid, pg. 19.*

same in 2022.[67] In other words, Amman has largely remained a monocentric city, with ever-increasing stress on the demand for mobility into its urban core.

Private Cars: On the Fast Lane to… Congestion

Even with rapid urban sprawl, GAM's studies in 2010 indicated that 80 percent of trips in the city lasted less than 30 minutes, 96 percent less than 60 minutes, and 22 percent less than 10 minutes, resulting in the prospect of "slow modes, especially walking," being competitive mobility options.[68]

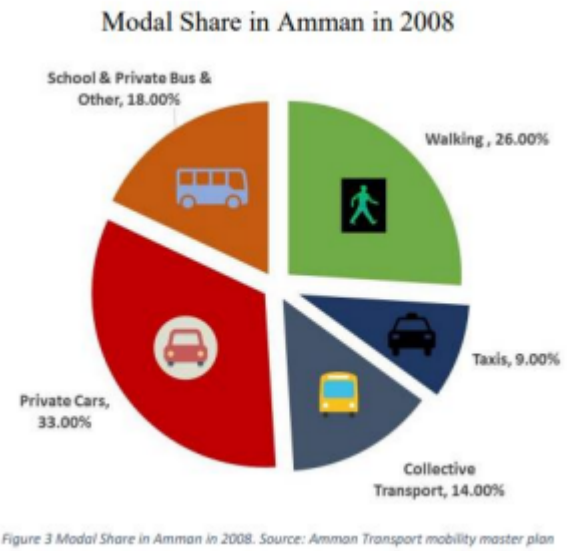

Figure 3 Modal Share in Amman in 2008. Source: Amman Transport mobility master plan

Fig. 4: Transport Modal Share in Amman, 2008 (Cavoli, 2017, based on data from GAM, 2010, pg. 2)

Despite this potential, GAM's 2021 Gender Action Plan for Equitable Mobility (GAP-EM) deems Amman to be "a car-dominated city," citing an increase in private vehicle ownership from one vehicle per 58 people in 1971 to an astounding one per six people

[67] *Albustanji, Abdullah Oqlah, et al. "A GIS Approach for Revealing Urban Mobility Hotspots: A Case Study of Amman City in Jordan." Civil Engineering and Architecture, 10(7), 3173 – 3184, 2022, DOI: 10.13189/cea.2022.100729.*

[68] *"Transport and Mobility Master Plan for Amman: Final Report." Greater Amman Municipality, Apr 2010, pg. 22.*

Fig. 5: Highway in the outskirts of Amman.
Photo Credits: Anav Jha

in 2021.[69] This is further reflected in Amman's modal share of transport, as per the 2010 GAM report, seen below in Fig. 4.

Private cars (particularly sedans, SUVs and pickup trucks) are by far the most common mode of transport, which stems from a variety of factors. As in many other parts of the world, government policy in Jordan has largely catered to the development of road-based infrastructure, such as roads, urban highways, and parking facilities. Clemence Cavoli, an expert in sustainable urban mobility and transport at the University College London, argues that the "city's streets are becoming a giant car park"[70] due to authorities "building a vast road network" and "providing free parking space," effectively "subsidising private transport."[71] One of the main reasons behind such a policy direction, once again common to many countries across the globe, particularly in the Middle East, is the high social value attached to car ownership and use. In fact, GAM's former executive director for transport and the traffic department was even quoted as saying, "it has almost become a stigma to use public transport. No city with such a big population relies so exclusively on cars like Amman."[72]

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[69] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 11.*

[70] *Cavoli, Clemence. "Past, Present and Future mobility challenges and opportunities in Amman." CREATE Mobility, 26 Oct 2017.*

[71] *Ibid.*

[72] *Kloub, Mohammed. "Not an easy job, but Amman's traffic headache curable - experts." The Jordan Times, 28 Jul 2016, https://jordantimes.com/news/local/not-easy-job-amman%E2%80%99s-traffic-headache-curable-%E2%80%94-experts.*

The continuation of such practices, particularly in the absence of efficient public transport services, has led to the sustained need for cars, as residents consider it convenient and accommodative of their travel needs.[73] Those without a car often rely on yellow taxis or rideshare services such as Uber and Careem, which have soared in popularity since their introduction to Jordan in 2017.[74] The most evident consequences of heavy car use have been incessant traffic congestion, for which Amman is notorious, and pollution.[75] However, car ownership and taxi use are ultimately only affordable to those with enough capital. Those in the lower socio-economic strata continue to suffer from disproportionate access to inclusive mobility.

Fig. 6: Busy road in downtown Amman.
Photo Credits: Anav Jha

Interestingly, unlike cities in many other parts of the world, the presence of two-wheelers, such as motorcycles and scooters, is nearly non-existent. This is attributed to heavy

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[73] *Weldali, Maria. "One in six own a vehicle in Jordan - report." The Jordan Times, 23 Jan 2021, https://jordantimes.com/news/local/one-six-own-vehicle-jordan-%E2%80%94%C2%A0report.*

[74] *Alkayed, Maram. "Amman's Yellow Taxis Compete for Passengers After the Arrival of Uber and Careem." Global Voices, 3 Jan 2018, https://globalvoices.org/2018/01/03/ammans-yellow-taxis-compete-for-passengers-after-the-arrival-of-uber-and-careem/.*

[75] *Kloub, Mohammed. "Not an easy job, but Amman's traffic headache curable - experts." The Jordan Times, 28 Jul 2016, https://jordantimes.com/news/local/not-easy-job-amman%E2%80%99s-traffic-headache-curable-%E2%80%94-experts.*

government restrictions on their use, due to civic issues such as noise pollution, and more importantly, safety concerns.[76]

Road Safety

Road safety in Amman is a complex issue with multiple layers. The first pertains to driving behaviours, wherein the use of turn indicators and seatbelts (on both front and rear seats) is rare. On the latter, it is extremely common for car owners to have clips inserted into their seat belt buckles in order to avoid the inbuilt alarms going off, despite the use of seat belts being mandated by law (needless to say, this isn't enforced in the slightest). When asked about why the seat belt wasn't working, a taxi driver we were travelling with during our fieldwork replied that "seatbelts are for fancy people." Speeding, too, is a common violation, a large portion of which is habitual, while incessant honking is moderate.[77]

The second element of road safety in Amman concerns the maintenance and roadworthiness of vehicles. Similar to many other cities in developing countries, scratches and dents from minor accidents (fender benders) are a common sight, as are broken or non-functional lights, particularly on older generation cars and buses (of which there are many).

A senior GAM official indicated to us during our fieldwork that penalising traffic violations is difficult for authorities, particularly because the methodology for fine collection is not very well developed, largely due to the traffic violation regulations not completely reflecting present-day conditions.[78] While this is an ongoing process, bureaucratic roadblocks result in delayed implementation.

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[76] *Mustafa, Mays Ibrahim. "Motorbikes spark controversy amongst Jordanians." The Jordan Times, 29 Oct 2022, https://jordantimes.com/news/local/motorbikes-spark-controversy-amongst-jordanians.*

[77] *Jadaan, K., et al. "Analysis of Driver Behavior in Amman Using Manchester Driver Behavior Questionnaire." Acta Tech. Jaurinensis, 14 (4), 440–454, 2021, doi:10.14513/actatechjaur.00599.*

[78] *GAM Official: Mayor's Office*

Road safety isn't restricted to only vehicles, however. Fig. 4 indicates that approximately 26 percent of trips in Amman are undertaken by pedestrians. Cavoli argues that car-centric urban planning has come at the expense of walking and micro-mobility such as cycling (which at present is not very common largely due to the hilly terrain).[79] She posits that the "environment for pedestrians is unsafe," attributed to "an intimidating environment," due to "hard to use" sidewalks which are "paved with obstacles," and "insufficient" or "nonexistent" pedestrian crossing facilities.[80] Indeed, each of these was something we experienced in Amman since pedestrian infrastructure such as sidewalks were often haphazardly designed (blocked by obstacles such as trees, ill-maintained with random openings, or coming to a sudden end), forcing us to walk on the road alongside faster moving vehicular traffic. Parked cars on sidewalks are another common obstacle, as is the lack of a clear prioritisation of pedestrians at intersections.

Fig. 7: Private Minibuses
Photo credits: Anav Jha

A UN-Habitat report from 2021 highlights a "clear deficiency in the planning and implementation of…sustainable transport modes such as walking, cycling and smart mobility."[81] GAM's GAP-EM furthers this by introducing the particular vulnerability of female pedestrians and cyclists, particularly due to the "sociocultural context."[82]

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[79] *Cavoli, Clemence. "Past, Present and Future mobility challenges and opportunities in Amman." CREATE Mobility, 26 Oct 2017.*

[80] *Ibid.*

[81] *"Mainstreaming Transport and Mobility into Jordan's National Urban Policy Thematic Guide." UN Habitat, 27 Jun 2021.*

[82] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 11.*

Public Transport in Amman: Riding the Bus Lane

Public (or collective) transport in Amman comprises different networks of buses. Cavoli contends that traditionally, these were run exclusively by private minibus operators, who did not receive any public subsidies, since "collective transport was perceived by public authorities as a commercial activity and not a public service."[83] Since then, however, public sector interest in public transport has increased. According to a senior GAM official we spoke to during our fieldwork, a light rail system (LRT) was envisioned as an efficient and sustainable form of rapid mass transit in Amman. However, the costs involved were extremely high, at over USD 3.2B for only 50 kilometres of track, making it an infeasible option.[84] Instead, after studying cities with similar geographical constraints due to hilly terrain such as Bogota, a bus rapid transit (BRT) system was chosen. With a capital cost of only between USD 120M and 250M, this was considered a far more economical option.[85] Planned in two phases, the first was completed in 2022, with the help of funding from the Agence française de développement (AFD). According to GAM's GAP-EM, "the current project includes…two BRT-dedicated corridors," with a total length of 25 kilometres and expects to have "140 coordinated buses" carrying "more than 315,000 passengers per day," with the two routes serving "major transit routes in the city," such as the University of Jordan, Sport City and Mahatta Terminal.[86] The second phase is currently in development, with another 50 kilometres expected to be added to the network in the next 10 years, with the help of funding from the World Bank.[87] From our experience, the BRT headway (or frequency) is currently 10 minutes, with operational times being 6 am to 10 pm on workdays, and 9 am to 8 pm on Fridays.

Amman's bus (including BRT) network features a smart card-based pay-as-you-go fare model. Therefore, unlike subscription-based fare systems, where an individual pays a fixed amount every defined amount of time, a card must be credited with a certain

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[83] *Cavoli, Clemence. "Past, Present and Future mobility challenges and opportunities in Amman." CREATE Mobility, 26 Oct 2017.*

[84] *GAM Official: Public Transport & Transport Projects*

[85] *Ibid.*

[86] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 20.*

[87] *GAM Official: Public Transport & Transport Projects*

amount of money, a set amount of which will be deducted every time the card is tapped. For those with a smart card, a single journey on the BRT costs JOD 0.55, while those without it must pay JOD 0.65 (by debit or credit card) aboard the bus. Compared to taxi and rideshare fares, this is a competitive price.

In addition to the BRT, a public bus system called Amman Bus has also recently been introduced. According to GAM's GAP-EM, it "aims to improve public transportation in the capital by operating 135 buses throughout 27 routes in central Amman," providing "a convenient transportation experience with advanced information system and electronic payments through prepaid and rechargeable cards," while being "regular and frequent…clean, safe and easy to use," and accessible and accommodative of "disabled and elderly passengers."[88]

However, despite these developments, challenges remain. Even though the bus networks, notably the BRT, were designed along Amman's busiest traffic corridors and equipped with state-of-the-art intelligent transport systems (ITS),[89] the GAP-EM identifies that the "public transportation mode share is not increasing."[90] This can be attributed to several factors.

For one, there are numerous parties "engaged in the transportation sector in Amman, which make it challenging to enhance the current transportation system,"[91] particularly since each has a different interest. A senior GAM official said that the traffic police, for example, is focused on regulating the use of cars, while the transport department is concerned about developing infrastructure, and there is little communication between them.[92] This is further complicated by a bureaucratic recruiting system in public institutions which prevents more "qualified" people from joining, acting as obstacles to capacity building.[93]

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[88] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 20.*

[89] *GAM Official: Public Transport & Transport Projects*

[90] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 3.*

[91] *Ibid, pg. 11.*

[92] *GAM Official: Public Transport & Transport Projects*

[93] *Ibid.*

The GAP-EM adds that the "transport sector lacks inclusivity to all groups, especially persons with disabilities (PWDs)."[94] Indeed, this is especially evident given how the first and last-mile connectivity questions, particularly along the BRT, remain largely unanswered, due to the lack of an established feeder network. According to the GAM official, private cars remain the main mode of first and last-mile connectivity, since feeder operators need to first assess commuter flows to identify profitable and viable routes,[95] in a process that can be considered more reactive than proactive.

However, our interviews with locals and first-hand experiences in Amman also suggested other reasons for low ridership. Despite the BRT being considered the flagship public

Fig.8: Devices on board, shelter and rolling stock of Amman BRT. Photo credits: Anav Jha

transport system in the city, many residents simply are not aware that it is functional. Part of this can be credited to the first phase taking over 14 years to be constructed, instead of the stipulated three years in 2008, making the BRT project both unpopular due to the traffic snarls it induced, as well as it being viewed as another government project that would never see the light of day.

More importantly, there is a very clear lack of wayfinding. GAM's plans to integrate the network with platforms such as Google Maps[96] have so far not been implemented. The Amman Bus website also does not have an up-to-date map of the bus network (the BRT

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[94] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 11.*

[95] *GAM Official: Public Transport & Transport Projects*

[96] *"Gender Action Plan for Equitable Mobility." Greater Amman Municipality, Dec 2021, pg. 38.*

line number, 99, was non-existent on the map). It must be noted that the Amman Bus mobile application does include this information, but accessing it requires a Jordanian phone number. Furthermore, even non-technological signs are absent. Bus stops (even BRT ones) for example, have no signage, including the name of the stop or the line number, direction and bus times. The buses themselves are very modern, with the option for contactless payments, and have available wheelchair ramps and USB charging ports. There is a digital screen which displays helpful route information and a map. However, this screen was not functional on one of our trips. Since there were no physical route maps in the bus' interior, finding our stop was a challenge. Addressing these wayfinding challenges is essential to increasing public awareness about the BRT and increasing ridership.

Amman's Future Mobility Goals

Amman has made considerable progress in moving towards the goal of safe, equitable and inclusive mobility. That said, its scope for improvement is immense. GAM's plans for increased transit-oriented development (TOD) aim to increase accessibility to people across the socio-economic spectrum through increasing public transport services and ridership, as well as the greater functionality (and presence) of micro-mobility infrastructure, such as sidewalks and cycle lanes. However, achieving these goals will be a slow process requiring improved cooperation between different public authorities, private transport operators, and of course, consistent dialogue with the public in identifying areas for improvement.

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5– HOUSING IN AMMAN: NEW ISSUES IN AN OLD CITY

Ruchira Paul - Jinglan Lin

Standing at the Citadel of Amman, one can witness the city's brown-beige buildings cover its hilly landscape for miles. Like ocean waves, the buildings rise and fall with the landscape, uniform at times, and at times not. A keen eye will find that a look towards the East shows smaller, more dense buildings, and the West, more sparse and bigger, taller buildings. The central business district, with its skyscrapers and glass buildings, is unmissable from the Citadel, and a line falls across the city, sharply dividing the East from the West.

Amman, much like other cities throughout the Middle East, has witnessed economic growth and rapid urbanisation. Between 1994 and 2004, Amman's population increased by 3.1 percent, while its built area grew by 4.2 percent.[97] Paired with neoliberal economic growth and the influx of Palestinian and Syrian refugees and displaced persons, Amman developed rapidly, but not uniformly (see the Introduction chapter in this report). There exists an obvious divide within the city; West Amman houses large villas and the shiny Central Business District, while East Amman is home to refugee camps and dense houses for the poorer sections of society. The difference in development within the city is not spatial alone but seeps deeper into society. While West Amman is home to the wealthier section of society, East Amman houses economically weaker classes, and refugee camps for Palestinian and Syrian refugees, and even South Asian migrants. The spatial changes in West Amman have affected the lives of those living or working in the wealthier neighbourhood, creating a more cosmopolitan, English-speaking population.

[97] *Ababsa, 2011*

The Crisis of Affordable Housing

Amman's rapid but non-uniform growth has led to a crisis of affordable housing. Housing costs in Central and West Amman rival that of European capital cities, but much of its population cannot afford these prices.[98] There is a severe lack of affordable housing in the city, which has led to the densification of informal housing in East Amman. While a significant population lives in self-owned homes (around 60 percent)[99] many continue to rent or live in refugee camps. Over the years, Amman has welcomed refugees from around the region, and refugee camps have grown significantly. Amman has, over the last two decades, accepted an influx of refugees from Palestine and Syria.

Fig.1: houses on hill
Photo Credits: Ruchira Paul

Today, the Palestinian population in Amman contributes to almost half of the population in the city, and the Jordanian government supports the refugees by providing formal citizenship to any who seek it. In the shelters around metropolitan Amman, camps which had originally housed people in tents have evolved into concrete and brick houses that have been built using materials which could be gathered from the surroundings, including from the ruins in the famed Citadel. These shelters have now taken the form of low-income informal housing.

Amman's formal housing market is unaffordable for most, and informal housing settlements have proliferated. 'With the average household in Amman Governorate earning an income of JOD 576 (EUR 780) per month, many households spend beyond their means on purchasing a new house or renting.'[100] Rental controls were removed in

[98] *Ababsa et al., 2021*
[99] *Ababsa, 2022*
[100] *Ibid.*

Jordan in 2010, and inflation along with the rise in energy prices, has put a significant strain on renters. Affordable housing in Amman is scarce, but the demand is higher than ever before. In East Amman, housing prices are more affordable, however, many of the buildings and apartments in East Amman are dilapidated or lack basic services such as sanitation facilities and stable water supply. In West Amman, rental prices are extremely high, and unaffordable for most of the Amman's population. Housing in West Amman, however, is more spacious, and better equipped with electricity, water supply and sanitation facilities.

Amman's housing crisis is rooted in the fact there is an over-supply of expensive housing in the city, but an undersupply of affordable housing. 'There is much more availability of spacious, expensive apartments in Amman than affordable ones.'[101] Jordan's property and construction sector has expanded rapidly over the last two decades. 'Jordan's private sector produced 1.1 million dwellings between 2004 and 2015, doubling the total housing stock.'[102] While numerous new houses and apartments have been built in Amman since 2004, these are mostly located in central or west Amman, where houses are spacious but also expensive. Although there is high demand for affordable housing, 23 percent of Amman's housing stock lies vacant, while 10 percent of houses are inhabited by two or more households.[103]

The high housing vacancy rates are partially caused by a reduction in real estate taxes for vacant housing units, an increase in the supply of high-end luxury housing, an increase in seasonal housing during the summer, and real estate investments mostly coming from wealthy Jordanians in the Gulf countries. The stagnant housing vacancy rate, coupled with the explosion of high-end housing production, has led to an oversupply of luxury housing and an undersupply of affordable housing in Jordan, especially in its capital Amman.

Amman's housing crisis is also affected by its housing policies. Jordan has high interest rates on mortgages, 'fluctuating between 7.5 and 8.5 percent for a 20-year loan'; a large population of Amman's tenants are refugees, displaced persons or working-class

[101] *Ibid.*

[102] *Abasa, 2021*

[103] *Ibid.*

Jordanians.[104] These high interest rates restrict the borrowing capacity of potential purchasers. Such policies continue to emphasise and shape Amman's east-west divide. Unaffordable housing in West Amman continuously pushes lower-income households to the East, where housing is already dense, imposing stress on resources and services such as water and public space.

Public Sector and the Lack of Policy Intervention

The lack of involvement of the public sector in the housing market has allowed the private sector to gain control of housing prices. A staggering 99.2 percent of housing production in Amman is private, around 60 percent of which is built by citizens themselves, often without a formal building permit.[105] The Housing & Urban Development Corporation (HUDC) has implemented initiatives to provide affordable housing to low-income families in Amman, but these projects have been developed around the periphery of Amman's planned urban area, which restricts lower-income populations from accessing amenities and jobs in the city.

The HUDC implemented an affordable housing scheme called the Royal Initiative for Housing (RIH) between 2008 and 2013. The scheme aimed to enable lower-income groups (monthly income below JOD 300 or EUR 395) to purchase housing at subsidised prices. The project led to the construction of houses in 10 governorates throughout Jordan. However, research showed that 'beneficiaries from the scheme were from a higher income group' than planned, and that the 'implemented scheme did not achieve the vision of providing affordable housing for the target group.'[106]

The lack of successful policies, and proliferation of luxury housing in Amman has created a gap in the market, and this has greatly affected the middle and lower-income populations of the city. As the population of Jordan continues to grow, there is a need to address this issue through policies and public sector intervention.

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[104] *Ababsa et al, 2021*

[105] *Abasa, 2021*

[106] *Al-Homoud and Is–haqat, 2018*

Fig.2: Premium, high icome type of housing. Credits: Ruchira Paul

Observations from Amman and Zarqa

The oversupply of high-end housing and undersupply of affordable housing, coupled with the high vacancy rate, were quite prevalent during our trip to Amman and Zarqa. Standing at the top of the hill near our hotel in West Amman, the new high-end modern development area, we saw very distinctive differences between East Amman and West Amman.

Moreover, as we travelled to the neighbouring governorate of Zarqa, we noticed many abandoned buildings either finished or unfinished. An Ammani resident told us that the vacancy of apartments or houses has become increasingly common and was exacerbated during the Covid pandemic. As such, the housing challenges faced by Amman are quite visible with the East-West divide and visibly vacant housing units.

While some efforts (such as RIH) have been made by the government, they have not produced significantly positive results. During our meeting with the city municipality, we were informed that the municipality is not involved in housing policies and does not tackle housing issues. Therefore, the private sector has overtaken the housing market, causing a gap in the availability of affordable housing for the economically weaker sections of society.

Amman's housing structure presents an example of a very visible urban segregation, but there exists mobility, both economic and social, within the city. The influx of refugees poses a new, and unique challenge for the housing market in Amman, and it is imperative for local authorities to prioritise housing issues in Amman. Amman is rapidly urbanising and has developed multiculturalism and globalisation. This growth must be paired with the provision of better housing for all who are welcomed in Amman. The privatisation of the housing market has led to a scarcity of affordable housing, but with intervention from the governing bodies, perhaps the housing issues in Amman can be tackled.

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6– MIGRATION, DISPLACEMENT AND REFUGEES

Eniko Charlotte Zoller - Milena Larue - Ioli Filmeridis

Who is a Refugee?

A refugee is legally defined as someone who has fled conflict, violence or persecution and sought safety in another country. They are unable or unwilling to return to their own country for fear of persecution based on their political affiliation, race, religion, or membership in a social or identity group, according to the United Nations High Commissioner for Refugees (UNHCR). The 1951 Refugee Convention is a legal document that defines and explains the term and outlines the rights of refugees. These include access to courts, primary education, employment, and issuance of documents such as a travel form.

While this international framework exists to regulate, protect, and oversee refugees, Jordan has not signed the 1951 convention or its 1967 protocol.[107] In addition, the convention does not apply to Palestinian refugees[108] receiving aid from the United Nations Relief and Works Agency (UNRWA) or to refugees considered nationals in their country of asylum (UNHCR). Jordan has signed other international human rights conventions, such as the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights and the Arab Charter on Human Rights, which cover the right to work, education and housing. These conventions,

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[107] *Francis, A. (2015). Jordan's Refugee Crisis. Carnegie Endowment for International Peace. https://carnegieendowment.org/2015/09/21/jordan-s-refugee-crisis-pub-61338.*

[108] *Most Palestinian refugees have attained full Jordanian citizenship (UNHCR), and about 20% live in 10 camps spread throughout the northern portions of the country. The national government, rather than UNRWA administers and polices these camps.*

however, are not legally binding, leaving legal status and rights vulnerable to political and policy changes.[109]

Refugees in Jordan

Jordan hosts the second highest ratio of refugees to citizens globally, with over 80 percent of the refugees and displaced persons residing in urban areas. Jordan's municipalities were neither equipped nor prepared to respond to the waves of Syrian refugees in the 2010s.[110] The 2013 Host Community Support Platform (HCSP) improved on coordination and included a consideration of the impact on host communities, requiring that 30–50 percent of humanitarian programming be directed to vulnerable Jordanians.[111] To administer and support a population that amounts to almost one-third of the nation,[112] the Government of Jordan (GoJ) leads the Jordan Response Plan (JRP), in an effort to coordinate and improve collaboration between the host government and the numerous (more than 150)[113] international bodies serving the refugee population. The JRP is the only national comprehensive plan to channel financial assistance for Syrian refugees.[114] The 2020-2022 JRP focused on addressing the needs of both refugees and host communities. The dual consideration is an important concern raised by those we met during our study trip to Amman. Addressing the socio-economic needs of Jordan's citizens alongside refugees is intended to address the vulnerabilities of host communities and build resilience and cohesion. Despite this intense international and local focus on

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[109] *Meral, A., Langley, M. and Barbelet, V. (March 2022). Inclusion and Exclusion in Urban Refugee Displacement in Jordan. Humanitarian Policy Group Working Paper. https://odi.org/en/publications/inclusion-and-exclusion-in-urban-refugee-displacement-in-jordan.*

[110] *Ibid.*

[111] *Ibid.*

[112] *Meral, A., Langley, M. and Barbelet, V. (March 2022). Inclusion and Exclusion in Urban Refugee Displacement in Jordan. Humanitarian Policy Group Working Paper. https://odi.org/en/publications/inclusion-and-exclusion-in-urban-refugee-displacement-in-jordan.*

[113] *Rabadi, W. (2020). Jordan Response Plan for the Syria Crisis 2020-2022. ReliefWeb https://reliefweb.int/report/jordan/jordan-response-plan-syria-crisis-2020-2022.*

[114] *Ibid.*

refugees and displaced persons, Jordan struggles to serve this population (in 2019, only 51 percent of needs were funded).[115]

Urban Refugees

Increasingly, refugees are choosing to resettle in urban areas, to seek employment, shelter and to access basic services. Depending on local efforts and attitudes, urban refugees are more or less likely to integrate with host communities, improve social cohesion, acceptance and participation in daily local practices. In Jordan, 80 percent of refugees live in cities and towns, with Amman hosting the highest number.[116] Our interviews with municipal representatives revealed the multiple challenges Amman faces providing affordable and accessible housing, water, infrastructure maintenance and transportation to its 2.2 million residents. The settlement of refugees in the city compounds the logistical difficulties, as well as the pressure on services and infrastructure.

A July 2022 survey of local perceptions of refugees revealed that over 90 percent of Jordanians were sympathetic towards refugees seeking economic opportunities in Jordan and 80 percent had a positive perception of refugees.[117] Half of the respondents indicated that the refugee crisis had had a negative economic impact. Jordanian authorities and communities emphasise the acceptance of refugees during discussions, interviewees echoed a broadly held belief that refugees were welcomed and should be incorporated into local institutions, frameworks and markets.

In contrast to the official narrative, refugees often feel vulnerable and discriminated against.[118] In one survey, interviewees cited police threats, precarious legal status,

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[115] *Ibid.*

[116] *Kakish, Y. (2022). Perception of Refugees in Jordan. Survey - Wave IV. United Nations High Commission for Refugees. https://www.unhcr.org/jo/wp-content/uploads/sites/60/2022/09/Perception-of-Refugees-in-Jordan-Survey_Wave-IV_Sep2022.pdf.*

[117] *Ibid.*

[118] *Meral, A., Langley, M. and Barbelet, V. (March 2022). Inclusion and Exclusion in Urban Refugee Displacement in Jordan. Humanitarian Policy Group Working Paper.*

disenfranchisement and exclusion, difficulty accessing assistance, corruption, high rental prices, threats of eviction, rights to work, labour exploitation and health vulnerabilities as contributing factors to feelings of insecurity and precarity.[119] Interviews with non-Syrian refugees and displaced persons indicate that many feel they cannot raise issues of maltreatment by employers or authorities for fear of being returned to their home country.[120]

Historical context: successive waves of refugees

Despite the prevalence of refugees in Jordan and the significant impact of their presence in Jordan's cities, our team was unable to meet or speak to any refugee hosting or serving agencies. The section below draws from readings and research as well as discussions with Amman and Zarqa authorities. In general, official attitudes towards refugees are accommodating and understanding. However, interviewees acknowledged the financial, social and spatial burdens and challenges of hosting such a large proportion of non-Jordanians and displaced persons. While Jordan is a key host country for many fleeing war and conflict, there exist inconsistencies in the treatment, status and narratives of refugees in Jordan. Assistance is often based on nationality.[121] For example, non-Syrian refugees may not have the same rights and access to services as Syrian refugees. NGOs serving non-Syrian refugees face more restrictions and are more likely to live in urban and peri-urban areas as there are no designated camps for them. With limited access to work permits and services, they endure multiple hardships compared to Syrian and Palestinian refugees.

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https://odi.org/en/publications/inclusion-and-exclusion-in-urban-refugee-displacement-in-jordan.

[119] *Ajil, A., Jendly, M. and Mas, C. An Empirical Inquiry into the 'Everyday (In)Security' of Syrian and Iraqi Urban Refugees in Jordan. Center for Crime and Justice Studies. (2020) 60, 1395–1415.*

[120] *Meral, A., Langley, M. and Barbelet, V. (March 2022). Inclusion and Exclusion in Urban Refugee Displacement in Jordan. Humanitarian Policy Group Working Paper. https://odi.org/en/publications/inclusion-and-exclusion-in-urban-refugee-displacement-in-jordan.*

[121] *Ibid.*

Historical and Political Context

Jordan has welcomed multiple waves of refugees, beginning with Palestinians fleeing the 1948 Arab-Israeli war, followed by successive waves due to cycles of violence (notably in 1967 and 1991). The Lebanese Civil War, the 1991 Gulf War and the Invasion of Iraq in 2003 led to additional flows of Lebanese and Iraqi populations. The Arab Spring in 2011 resulted in an influx of Syrian refugees, doubling the population of Amman. In total, Jordan hosts about 2 million Palestinian refugees, 1.2 million Syrian refugees and 140,000 Iraqis, among others. Palestinians who arrived prior to 1967 were granted citizenship, while the second, 1967 wave received temporary Jordanian passports, institutionalising different legal statuses within this group.[122]

The Government of Jordan (GoJ) and its subsidiaries emphasise the integration of the multiple flows of refugees. Most refugees have settled in urban areas, but there remain multiple refugee camps, 10 for Palestinians and five for Syrians. Many of these camps have evolved from temporary shelters to more permanent dwellings, surrounded by or integrated into dense urban areas. While not formally acknowledged as a camp, Zaatari, the largest permanent refugee camp in Jordan, has evolved into an urban area. As of 2022, Jordan has Syrian registered 672,952 refugees, one fifth of whom live in camps and the remaining (542,000) in urban areas, including Amman (26 percent).[123] Among the many challenges Syrian refugees face, low educational enrollment, health and employment, low standards of living and poverty (80 percent of Syrian refugees fall below the poverty line compared to 15 percent of Jordanians).[124]

While Jordan has often leveraged its role as a stable host country to solicit political and financial support for its own development needs, the proportion of refugees to citizens strains the country's administrative, spatial, social service and budgetary capacities.

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[122] *Meral, A., Langley, M. and Barbelet, V. (March 2022). Inclusion and Exclusion in Urban Refugee Displacement in Jordan. Humanitarian Policy Group Working Paper. https://odi.org/en/publications/inclusion-and-exclusion-in-urban-refugee-displacement-in-jordan.*

[123] *Karaspan, Omar. (January 2022). Syrian Refugees in Jordan: A Decade and Counting. Brookings. https://www.brookings.edu/blog/future-development/2022/01/27/syrian-refugees-in-jordan-a-decade-and-counting/.*

[124] *Ibid.*

Urban challenges such as the availability of water, affordable housing and livelihoods grow. As a result, conflicts between Jordanian citizens and incoming refugees and displaced persons have emerged, for example, around access to water and housing. The World Bank estimates that Syrian refugees cost the country $2.6 billion annually or six percent of GDP. However, resettlement projects funded by international and bilateral donors have helped spur Jordan's economy. Refugees also contribute significantly to both the formal and informal labour markets, in some cases contributing to gaps in local employment supply and in others, being accused of supplanting local labour.

The Jordan Compact

Generally, Syrian refugees are permitted to access work permits in specific sectors, enabling greater self-sufficiency and contributions to the local economy. Signed in 2016, the Jordan Compact created opportunities for Syrians to access the local labour market in return for greater labour market access for Jordanians in the European market, and access to European loans and foreign investment.[125] Jordan simplified the process of applying for and issuing permits for Syrians - increasing permits from 4,000 to 40,000 within one year.[126] With support from the International Labor Organisation (ILO), Jordan's trade union issued the first work permits that were not tied to a particular employer or position. These temporary work permits were issued in 2017 and came with a fee of USD 70 and were provided to Syrian refugees who were working in construction and had prior certification of skills. Efforts such as providing work permits, even if temporary, facilitate the registration of workers, formalise the labour markets and regulate access to employment for refugees and Jordanians.

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[125] *The compact does not include similar provisions for non-Syrian refugees.*

[126] *NA. (2017). Jordan Issues First-of-Their-Kind Work Permits to Syria Refugees in the Arab Region. International Labor Organization. https://www.ilo.org/beirut/media-centre/news/WCMS_568722/lang--en/index.htm.*

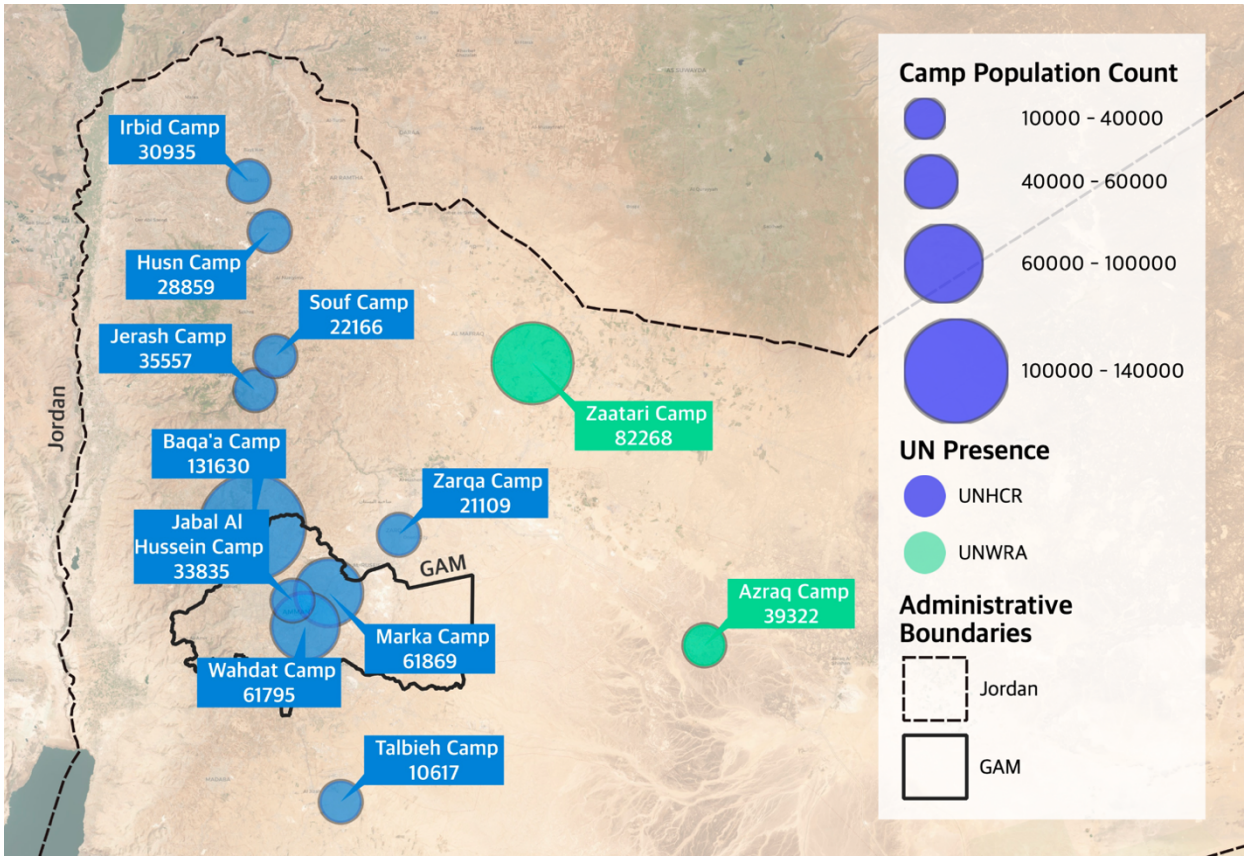

Fig 1: UNHCR and UNRWA refugee camps in Jordan, mapped (Jules Percher) from: UNHCR Jordan "Refugee Camps" accessed at https://www.unhcr.org/jo/refugee-camps UNWRA Jordan camps information accessed at https://www.unrwa.org/where-we-work/jordan Camp de réfugiés d'Azraq, Ismae; Zein, Observatoire des Camps de Réfugié-e-s Pôle Étude et Recensement des camps Zone Afrique du Nord et Moyen-Orient, Mai 2020.

NGOs and International Organisations

Among the larger and most prominent organisations are the UNHCR, UNRWA, IMO and ILO, which focus on the training, employment, and vocational opportunities for Syrian and Palestinian refugees. Local and international NGOs provide camp management and service provisions that include health, education, and food distribution, while organisations serving refugees in non-camp settings provide access to livelihood training and the provision of physical and mental health care. Many organisations are working to serve both local and host communities and refugees, to ensure the mutual benefits of these groups and limit perceptions of inequity that could lead to tension and conflict between groups. Jordan's image as a welcoming and stable host country depends on

the ability to maintain and improve living standards for all of its population. Given that public schools are free to refugees and access to national health systems is also available to refugees, the burden of service provision and infrastructure maintenance is heavy for this resource-constrained country. International and local organisations are essential to supplementing the GoJ's efforts.

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7– WALKABILITY & ACCESSING PUBLIC SPACE

Marie Hartmann - Sokhna Dukret-Ndyaie - Aissatou Mbaye

Walking around the city of Amman is quite an experience! Bustling with cars, taxis and motorcycles, local pedestrians still seem to make their way through this traffic. The original design of the city and its hilly terrain have resulted in its own interesting quirks with respect to walkability. Through our discussions with officials, we have learned that the municipality is trying to improve the equity of access on the ground.

Fig.1: Trafic in Downtown Amman.
Photo Credits: Marie Hartmann.

A Car-Centric City

Mobility in Amman is designed around the automobile. The number of cars has increased tremendously over the previous decades. In 1971, one person in 58 had a car. Today, one person in six has one.[127] From our short experience in Amman, it seems the urban design and development have favoured cars over other means of transportation.

The rapid urbanisation and population growth that the city has known since the 1950s, has not been coupled with efficient public transportation and has instead largely contributed to a car-centric approach in urban planning. Amman is based on a circular model and has a well-developed road network to accommodate private vehicles. Numerous highways, major roads, and intersections have been constructed to facilitate car travel. Public transportation is limited, having long relied on private management (private and

[127] *Abu Hussein et al., 2021*

informal bus systems and taxis). The coverage, frequency, and reliability of public transportation remain a challenge.

Amman is dependent on vehicular-based transports with few alternatives and, at first glance, does not appear to be pedestrian or cycling-friendly (the hilly terrain might also contribute). Sidewalks, as well as street furniture and vegetation, are some of the main components claimed to be needed by urban dwellers.[128] However, it is important to note some efforts have been made to improve pedestrian infrastructure in certain areas of Amman and tackle the car-centric nature of Amman's urban design. The development of bus rapid transit (BRT) lines to improve connectivity and enhance the public transport mode share is one of them.

Poor Pedestrian Infrastructure

The GAM (Greater Amman Municipality) Amman Climate Plan for 2050[129] aims to reduce Amman's carbon emissions.[130] If the promotion of walkability may entail a substantial tool to reach the set goals, the urban reality of Amman may prevent such a scenario from unfolding. Amman is built on a set of seven hills hosting the city's historical centre – home to poorer households.[131] There, our team observed very narrow streets. Other streets are only made of staircases varying in size and length – allowing pedestrians to gain access to the upper parts of Amman's hills. In contrast, newer neighbourhoods are located away from the city's historical centre and offer flatter and wider streets, enhancing the circulation of cars.[132] It appears that this fits the social standards of middle-class residents for whom walking for transportation purposes is undesirable.[133]

Initially, the maintenance of streets was under the responsibility of owners (such as property and store owners).[134] The municipality expected them to take the necessary

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[128] *Ibid.*

[129] *Greater Amman Municipality, 2019. The Amman Climate Plan.* https://www.amman.jo/site_doc/climate.pdf.

[130] *Abdeljawad & Nagy, 2021*

[131] *Abed & Tomah, 2014*

[132] *Ibid.*

[133] *Ibid.*

[134] *Ibid.*

initiatives to keep streets clean and clear. However, compliance is patchy, for example, materials used for the completion of homes under construction might be left on the sidewalks.[135] Beyond the responsibility of homeowners, some drivers park their cars on the sidewalk due to the expense and unavailability of parking. In some areas, trees appear in the middle of the sidewalk – perhaps placed before the installation of asphalt. While these trees could provide much-needed shade, they also represent safety hazards for pedestrians. The maintenance of sidewalks also presents a challenge to local government, as does the presence of informal street vending.

Having a higher density, the district of Qasabah accounted for 44 percent of pedestrian accidents in Amman.[136] The elderly, women, children and young individuals from 15 to 29 years old are particularly exposed to these fatalities.[137] Moreover, 35.9 percent of accidents involving vulnerable pedestrians occur at night.[138] This is explained by inadequate public lighting in Amman's streets, which adds to safety hazards for pedestrians.

Who Can Access Public Spaces?

The use of public spaces in Amman is structured very differently from traditional European cities. The Central Business District (Al-Abdali) has few residents and isn't situated in the city centre. The centre is articulated around a main mosque, the Grand Husseini mosque, around which the souks are located: the Souk Al-Sukar, the Souk Al-Bukareh, the Souk Mango and so on. These spaces are mostly pedestrian and it is difficult to navigate them with a car. Furthermore, Amman is used in a very horizontal way rather than vertically. The horizontal use of the street emphasises the street's role as a public space that accommodates a variety of activities beyond just vehicular traffic. It recognises the importance of creating vibrant and lively streetscapes that cater to the needs and preferences of pedestrians and promote social interactions. In Amman, streetside commerce is the most relevant illustration of horizontality. People invest in sidewalks in

[135] *Ibid.*

[136] *Al-Majali & Imam., 2019*

[137] *Ibid.*

[138] *Ibid.*

front of shops and have no trouble sitting next to each other, on the street, for lunch or a quick mid-afternoon snack.

The citadel is an amazing panoramic view of the city, becoming a place of gathering. However, there are very few parks, in part attributed to the local geography, which are considered "destination parks" and can only be reached by car, not as an everyday amenity for inhabitants to enjoy. On the other hand, the public space in front of the old Roman amphitheatre is a popular gathering place for residents. Gender dynamics of the wider society are translated into the experience of public space. We see this in the way that children and young people use this space, often in sex-segregated groups. Boys and young men are more active in appropriating the public space, playing football, running around, while girls and young women remained within their own groups.

Fig. 2: Women gathering and child playing by the amphitheatre. Photo Credits: Marie Hartmann

Gender and Urban Mobility

Gender dynamics are also a pressing issue in urban mobility in Amman. From our short experience and from the insights we gained from the professionals who have researched the experience of women in the city such as the Gesellschaft für Internationale Zusammenarbeit (GIZ) or the Friedrich Ebert Stiftung (FES), it appears clear that the city of Amman urban structure can enhance gender inequalities. The city has not been planned for and with everyone in mind.[139] Women appear to have a unique perspective and experiences in their built environment.

When addressing urban mobility issues, it appears as a right for everyone to be able to transit freely. However, as mentioned, women's and minority groups' perspectives as transit users are often set aside. The

[139] *Keuss, 2020*

simple fact that the word 'gender' does not have a proper translation in Arabic is telling. Urban planning, as well as transport planning, are not gender-neutral or gender-blind but are largely based on the male perspective. The first challenge is to recognise this fact. Hence, when public transport is presented as a solution to tackle car dependence, it is important to highlight that public transport may not be designed for all users. Indeed, women -but also other marginalised groups- are less inclined to use them, for reasons such as safety and cost.

Some interesting actions are undertaken to tackle the issue, such as the 'Amman Gender Action Plan for Equitable Mobility' implemented by the foundation Friedrich Ebert Stiftung (FES) with the Greater Amman Municipality (GAM). This action plan underlines the urban design shortcomings that caused lack of security and safety for certain groups of people.[140] It targets different concerns: safety and security, regulation and policy, built environment and digital infrastructure, and programs and systems.

Fig. 3: Children playing by the amphitheatre.
Photo Credits: Marie Hartmann

Inequality in Access for Disabled People

As mentioned earlier, the streets of Amman present safety hazards for pedestrians, and even more so for disabled people. Numbers from the United Nations Economic and Social Commission for Western Asia (ESCWA) assessed that Amman is Jordan's city having the highest share of disabled people (32.3 percent).[141] However, through our research, we noticed that information on their condition as city dwellers of Amman is limited.

[140] *Abu Hussein et al., 2021*
[141] *UN, 2004*

From our observations, wheelchair users were moving on the side of the roads. While the design and layout of streets prevented them from circulating freely and safely, some public spaces, including the GAM and the Abdali Mall, offered access to lifts. The presence of safety hazards in the streets of Amman, as well as the lack of infrastructure giving access to the disabled, enhances their social isolation. Moreover, we are unaware of any large-scale surveys that could aid the municipality in designing substantive measures to enhance the inclusivity of disabled people in public spaces.

Concluding remarks

To conclude, Amman is a car-dominated city whose urban plan bears the imprint of car-centric design. Pedestrians are rare in the wealthier parts of the city, especially because of the lack of infrastructure to make the walking experience pleasant. Moreover, public spaces in Amman have two aspects. On the one hand, these spaces are constrained by social rules and monitoring, so some groups can feel excluded. On the other hand, they are also facing numerous issues of safety and security. Therefore, a challenge for Amman is to better enhance accessibility and inclusivity of public spaces and mobility.

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8– PIPELINE POLITICS AND WATER GOVERNANCE

Simon Huguet - Marthy-Palata Mavungu - Mirabelle Deffie-Echallier

Jordan is the third most water-scarce country in the world. Due to its location in a desert zone, rainfall is very low, and almost all of it evaporates. As a result, average per capita water availability is around 145 cubic meters per year, well below the world average of 1,000 cubic meters per year. The country relies mainly on three sources to meet its water needs: groundwater, surface water and non-conventional water (such as seawater desalination and the reuse of treated wastewater). Amman faces a growing demand for water due to population growth and rapid urbanisation. Water consumption in Amman accounts for around 40 percent of total water consumption in Jordan.

Water diplomacy is therefore of crucial importance for Jordan, given the scarcity of water resources in the region and the sharing of watersheds with its neighbouring countries, Syria, Saudi Arabia, Iraq and Israel. Negotiations and cooperation on water issues are essential to ensure equitable and sustainable access to this precious resource. For example, the 1994 Israeli-Jordanian Peace Agreement includes a specific section on the management of shared water resources, notably with regard to the Jordan and Yarmouk rivers and Lake Tiberias. Discussions and negotiations are underway to reach cooperation agreements on the use and sharing of water in transboundary river basins.

It is in this context that the Red-Dead Sea Project was conceived. This is a regional cooperative effort to desalinate and transfer water from the Red Sea to the Dead Sea to generate drinking water for the surrounding region. Although this project only affected Jordanian territory in terms of infrastructure, it was also financed by the Israeli state, which was supposed to be supplied by the project. However, the project was abandoned in 2021 due to Israel's eventual disinterest in the project, according to Jordanian officials.

In addition to problems linked to the country's aridity and difficult regional cooperation, other structural problems prevent the Jordanian population from having continuous access to drinking water. Indeed, until the early 2000s, almost 50 percent of the water

entering the city's distribution system was not effectively accounted for, half being lost through leaks and the rest due to poor management and inadequate payment. This water is known as "non-revenue water". The proportion of non-revenue water in distributed water fell significantly in the early 2000s. Targets to reduce this proportion further have not been met partly due to the arrival of Syrian refugees since the mid-2010s, which has put further strain on water resources.

In Jordan, water is a state-subsidised commodity to guarantee its accessibility to all citizens and all sectors. However, according to a World Bank report, the low cost of water in Jordan does not encourage the optimisation of irrigation systems, leading to misallocation or, more simply, loss of resources. State intervention in regulating water prices also has negative effects on public finances, since revenues from water distribution are low and insufficient to maintain existing infrastructures or invest in new projects.

Impact on the Population

An official from the Miyahuna water company told us that, "Supply for everyone is key. Every single person has the right to have water." Guaranteeing this right is, however, a challenge. More than 90 percent of metropolitan Amman's residents are connected to the public water supply system, the variety of actors have different needs, and the water infrastructures are subject to threats.

Most households adhere to a weekly system of replenishment. The public service Miyahuna fills up the water tanks in their building once a week, and residents use their reserve every day for domestic tasks. Information campaigns on television and on social media educate residents to limit water use and water waste. It has been observed that there is an uneven distribution of water based on geography: in East Amman, where lower income classes reside, there are fewer and more damaged pipes, which negatively affect the water supply, while in West Amman, residents benefit from well-managed pipes that can ensure more consistent water supply. Critical infrastructure such as hospitals are prioritised for a constant water supply. Refugee camps are also high on the priority list as there tends to be less storage infrastructure at the household level. Community conflicts can emerge if donor funding enables displaced persons, migrants or refugees to outbid locals for water. In Amman, water is politics and supply shortages can create political turmoil as they did in 2011-12.

The non-continuous nature of public water supply has resulted in parallel private and illegal/irregular networks of water distribution. During our study trip, we were told that the water demand of businesses like hotels is so high that they go through private contractors to meet it. Private contractors use tankers to cover the shortfall in poorer neighbourhoods and to increase the upper classes' consumption during the summer by supplying them with additional water. This parallel private network defeats the principle of subsidised water for all as, ultimately, the larger consumers are pushed away from the public water supply system and finance private tankers and well-owners. The cheaper price and the shorter waiting periods have attracted many consumers to turn to illegal wells. Lower-income households, construction industries or businesses are provided non-potable water for non-domestic uses.

Furthermore, with political instability in the region, water is a national security issue, and water infrastructure has to be monitored to prevent malevolent acts that could negatively impact Jordanian residents. Under the Ministry of Water and Irrigation, the Water Infrastructure Security Department has been acting to protect water resources in accordance with the Water Authority of Jordan law promulgated in 1988. An advanced strategy has been put in place at the national level to protect water. Along with the monitoring of water reservoirs with cameras and on-site security patrols, the population has also become an active actor in the prevention of threats. Citizens report to the police any acts of sabotage or suspicions about the same. There is also greater monitoring towards threats such as chemical and biological contamination, or cyber-attacks that can jeopardise the SCADA system.

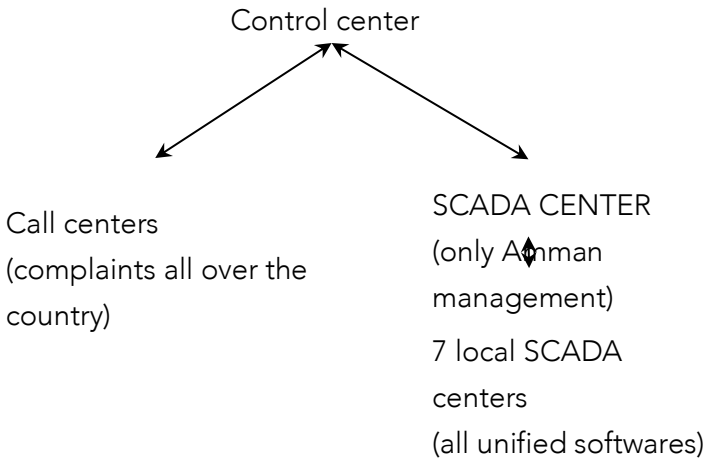
Miyahuna and SCADA System for Water Management in Amman

Miyahuna LLC has been in charge of providing water and wastewater services in Amman since 1999 as contracted with the public Water Authority. Thus, Miyahuna has the authority to manage and operate water facilities, to collect wastewater, maintain the water network and operate several wastewater treatment plants for a period of 99 years. Their contract was extended to the sanitation and management of water for Madaba in 2013, and for Zarqa in 2015.

In total, Miyahuna operates in a 13,556 square kilometre area in the three governorates, operating water on 152 sites (132 in Amman and 20 in Madaba). They manage a daily water supply of 662,733 cubic meters delivered to Amman, with an average flow of 700 cubic meters per hour. The distribution relies on five main water sources located in Zai, Zara, Springs, Wells and Desi, and a network equipped with pumping stations, reservoirs and boosters.

Amman's average consumption is 65 cubic meters per capita per year for one million customers, which is very low compared to the global 500 cubic meters per year per capita, mainly related to the shortage in water resources. Miyahuna and the government give incentives for water conservation and raise awareness with brochures and TV spots. Even if the state owns the equipment and the decision-making is managed at the city level, since Miyahuna is in charge of running the system, they have a real say in the process of decision-making.

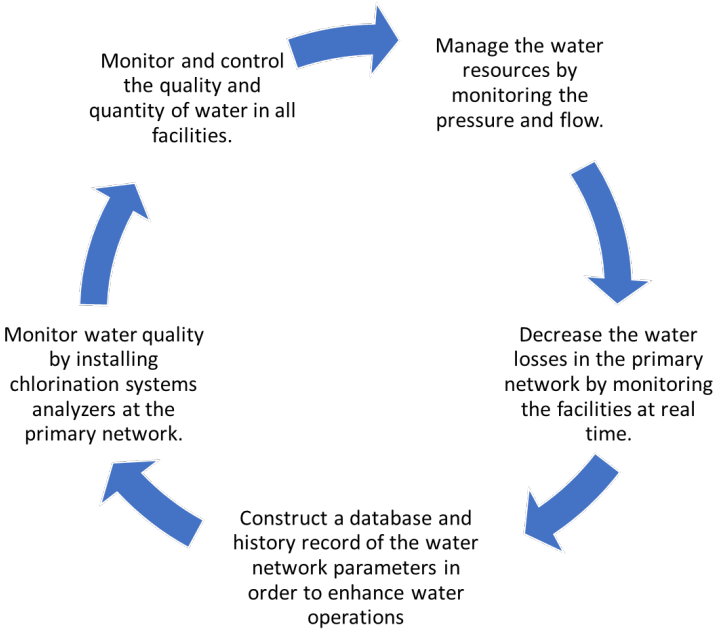
During our study trip, we had the opportunity to visit the SCADA Center, the operational command centre of the water management of Miyahuna. The organisational chain of command is the following:



The SCADA SYSTEM (Supervisory Control And Data Acquisition), is a category of software applications to control the industrial processes of the water management system. It means that the SCADA system can gather real-time data from remote locations (such as from sensors in water reservoirs and boosting stations) to monitor and control the equipment and its condition of functioning. By using hardware and software

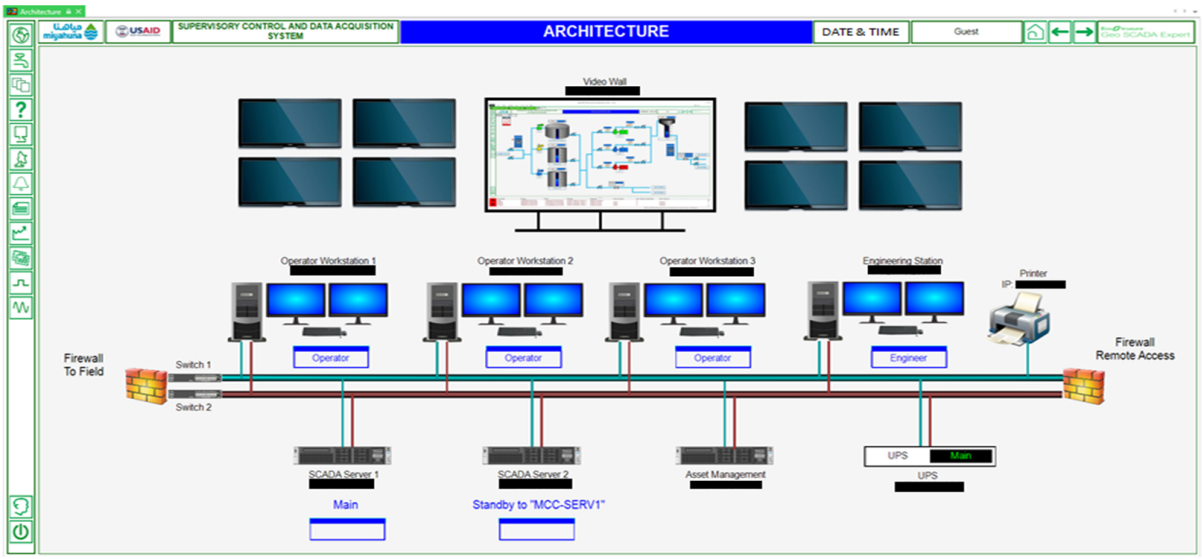
components, the SCADA system records and logs all events to report and display the current status and issues in real-time, and warn decision-makers if the water supply is compromised in any location.

The four steps of their work are network management, pump optimisation, water quality monitoring and increasing automation for telemetry solutions. The SCADA System uses a closed-loop methodology to maintain water supply, according to Miyahuna.



The system performs the four following functions, in the Scada Center, according to the following architecture:

Data Acquisition → Data Communication → Data Presentation & Information → Monitoring & Control



Then the data and resources are sent to the seven local SCADA centers: Dabouq Reservoir, Dabouq Booster, TADJ, Ain Ghazal, Abu Alanda, Damkhi and Madaba.In terms of management tools, Miyahuna is firstly processing a water data analysis, then comparing the KPIs (Key Indicator Performances) to their standards, displaying the trends and producing automatic reports.

Although Miyahuna is facing some challenges, such as a shortage of water resources, the NWR (non-revenue water) reduction, the need to improve the cost recovery or the geographical expansion of the serviced areas by merging other Governorates under Miyahuna Umbrella, they are setting ongoing plans for the next years. Miyahuna plans to implement a smart platform to automate the operations of the whole primary system aiming to reduce the NRW and to expand the comprehensive main SCADA system to include more governorates under the firm management, such as Balqa and Zarqa.

Since only 20 percent of the ten dams produce drinkable water, the piped water in Amman is not sufficient for consumption. After use, the used water is collected, treated, and sent for agriculture and irrigation.

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